A NOTE ON THE FUTURE OF THE MINT WORKSHOP WITH SUGGESTIONS CONCERNING TECHNICAL EDUCATION.

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The question of the future of the Mint Workshop has needed settlement for some time and I think that it should be decided early.

There are three possible futures of the Workshop.

Three possibilities for the future.

I. The Workshop can revert to the minimum possible requirements of Mint, Stamps and Electricity Departments and be put back on budget lines.

II. It can continue in its present unsatisfactory haphazard way.

III. It can expand, become fully commercial and undertake thorough training for artisans with the possibility of advancing further if really successful.

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Necessity for the continuance of the Workshop.

I. It is essential that the Mint, Stamps and Electricity Departments should have a repair shop and so long as the State makes its own coins a sufficient staff must be maintained in order to be able to carry on this work when needed. Many of the operations require skill, and it is not possible at a moment's notice to engage a completely new personnel to produce satisfactory results. This being so, if the first possibility were entertained, a very large percentage of the staff would be entirely unemployed for long periods. The loss that Government would suffer throughthis might not be large enough to be of real importance, but the men, through being

idlers, would deteriorate seriously, which, I think, is highly undesirable.

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Carrying on as at present not satisfactory.

(II) Affairs can continue as at present; I do not, however, consider that the existing arrangements are satisfactory from any point of view. The concern is, as it were, neither fish, flesh, fowl nor good red herring.

Difficulties of working when tied by Government Rules.

The Workshop is practically tied by Government Rules and Regulations which make its economical working extremely difficult. The men, as Government servants, consider themselves entitled to all kinds of privileges, which no ordinary employer of labour would give, and cost of which are of no value so far as promoting the welfare or happiness of the workers is concerned.

Difficulty of keeping up a good standard of work commercially.

The result is that the high standard of work, that is aimed at, is extremely hard to maintain or indeed impossible, while competing with the rates charged by bazaars for articles of similar usage. The Mint prides itself at present on turning out articles of the highest quality reasonably possible, whereas in the bazaar the predominant idea is to turn out an article that will "do" some how.

Government Officers do not care to pay for good work.

The result of this is that Government Officers, who are not trained to observe the difference between good and bad work, object to paying higher prices to the Mint, not realising the better quality that they get for their money. Other Departments make use of the Workshop grudgingly so that for purposes of the State generally it is of but little utility.

Existing unsatisfactory training.

At present, there is an uncertain amount done in the way of turning out mechanics and artisans in various branches of engineering. A number of unpaid

apprentices are allowed in; these pick up their work from the better skilled artisans, and by virtue of the fact that a high grade of work is insisted upon become more skilled men at start than their predecessors. A little primary education is given in order to be sure that all the boys have some knowledge of the rudiments. The whole business, however, is completely unsatisfactory. It is neither a good workshop nor a good educational department, yet, I think, it is fairly inoffensive at present, and, if it is so desired, it can continue its halting gait.

Possibility of continuing as at present.

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Progressive policy urged.

III. This proposition would mean a radical change. Instead of mediocre attainment, excellence of result would be the object, not only excellence with respect to the finish of the goods but excellence in the spirit imbuing themmen in the works and, more especially, excellence of training and teaching so that a grade of workshopmen, superior to all other artificers in India, might be produced.

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My ideas concerning the attainment of these results are as follow :--

Complete commercial footing essential.

First and foremost, the concern must run on commercial lines, that is to say, it must produce the highest quality of goods in competition with the market so that it can obtain purchasers for them whether by virtue of their low price or high quality and, while doing so, it must make an adequate return on the capital invested after providing for upkeep and depreciation.

Budget system of accounts to be abolished.

for good commercial working of such an under-taking it is essential that the accounts should be so

arranged that, frequently and rapidly, the progress of the concern can be discovered. It is very nearly impossible to do this with the arrangements that are still adopted by the Government in dealing with all the departments. The only way to accomplish this is to make the concern live on its earnings. When this is done, constant watch has to be kept to see that the necessary funds for meeting commitments are available by frequent striking of trial balances, examination of the cash balances and checking the stock.

Capital. The necessary capital for the purposes of the Workshop Department would of course be supplied by Government, the amount being arrived at by taking the value of the plant, buildings and so forth as stated at the last valuation, less depreciation, or by having a fresh valuation made together with the value of stores in hand at the date of starting and a sum to be agreed upon in the way of working capital for trading purposes. Only a budget statement consisting of the additional capital needed year by year and the amount of interest and dividend that it is anticipated that the Government will receive would be submitted.

Audit. To accomplish this, the system of auditing would need a complete change. Although auditing is supposed to be a check on accountancy, in actual fact according to the existing methods, it is engaged almost completely in discovering the compliance or otherwise with regulations and sanctions, and the scrutiny of the accuracy of the book keeping suffers thereby. It would be necessary to adopt a proper commercial audit on trial balances, pre-audit being entirely abolished and the auditors relieved of all duties other than those for which commercial concerns engage these officials. Commercial audit properly carried out is, of course, far more searching with regard to the probity of the management of a concern than the laborious system at

present indulged in. Commercial concerns would notadopt these principles if it were not so.

Procedure for making payments.

Before the work can be carried on, as suggested, it will be necessary for an authority to be constituted with powers to pay the bills of tradesmen and so forth. This can be dealt with in two ways.

(a) By vesting that authority in the Mint Master

(b) By appointing a committee for the purpose.

Previous powers of Mint Master.

In the beginning of the operations, when Sir George Casson Walker was Finance Minister, the whole of these powers were vested in me, but during my absence in 1912, while the late Mr.Habibuddin was Accountant General and Mr.Glancy, Finance Minister, the policy was reversed and the concern put on strictly budget lines.

Board of Control.

If there is any objection to my again being invested with the former powers, the difficulty can be overcome by constituting a Board of Control in whom would be vested powers exactly equivalent to those enjoyed by the directors of commercial enterprises.

Its advantages.

If it is necessary to have a Board of Control for this purpose, it might also have other valuable advantages viz., the fostering of a spirit of co-operation with regard to the enterprise among the departments that ought to be interested. At present, the workshop is felt to be and is, indeed, an integral part of the Finance Department and, as such, it is looked upon by other Departments as belonging to a rival concern. I think that a suitably constituted Board of Control might assist to minimise this feeling and make the concern omni-departmental.

Personnel of the Board.

With this in view, I think that the constitution of the Board might be as follows :--

President :-- The Finance Member (Mr. A. Hydari)"
Mr. Fakhruddin Ahmed Khan

Members :-- The Chief Engineer, P.W.D. Irrigation,
Mr, Mir Ahmed Ali
The Chief Engineer, P.W.D., General Br.,
Mr.M.Karamatullah
The Director, Education Department.
Mr. Ross Masood.
The Director of Industries & Commerce
Mr. Mahammadi

Managing Member :-- The Mint Master (Mr.R.L.Gamlen.)

Working of the concern.

So far as the working is concerned, the Board could have control exactly similar to that of an ordinary commercial directorate, holding monthly meetings to receive reports with regard to the working and to make suggestions concerning the progress and improvement of the undertaking and to pass and sign cheques for payment of bills, but the whole management should be left entirely in the hands of the Managing Member and no Member of the Board should be permitted to give personally any orders either to the Managing Member or to any of the employees belonging to the Departments. The Managing Member would be at liberty to request assistance from any of the members and to obtain advice from them, should he require it at other times than at the Board meetings.

Functions of the Workshop.

The Workshop, then, should have three functions.

(1) It should serve the purposes of all the Departments of Government that require its assistance

(2) It should serve as a training ground for the improvement of all classes of artisans and handicraftsmen at present available and for the training of at least the subordinate engineers required by the various departments of the State.

(3) It should undertake general commercial engineering and manufacturing.

This last is essential so as to maintain a volume of work in the concern sufficient for commercial success and also to serve as the means by which the apprentices can learn.

Training of Engineering Supervisors.

A special instance of utility can be mentioned in the training of men who have to look after the mechanical appliances in the State. The time during which most is learned of a machine is when it breaks down and has to be repaired. If repair jobs of all kinds were sent in to the Workshops the budding engineers would see the condition in which they came in and by having to repair them would learn to appreciate the care that should be taken of them.

Forming of character of Indian workmen.

I consider that one of the most essential things with regard to training of Indian workmen today is the inculcation of a sense of responsibility and self-reliance, and it is of the highest importance to give them a course adapted to it. I think, therefore, that the new ideas that are growing up in other parts of the world should be tried. I am well aware that particular difficulties would be met with here and also that the effort might easily end in failure, but I think that with sympathy success should be obtained, in which case almost untold benefit would accrue, and even at worst, the policy could be abandoned without any great difficulty.

Co-operative working in the Workshop.

I refer, of course, to what has been called Industrial Democracy, whereby men are encouraged to form themselves into advisory bodies with regard to all matters connected with the carrying out of the undertaking. There is no necessity at the present moment to define the exact details of the working out of the idea. There is one important point, however, viz., the encouragement whereby the men can be persuaded to accept and work it and that is by making arrangements whereby they themselves can benefit by improved costs of production.

Generally speaking, there would be an agreement with the Government as to the amount that the Workshop would have to provide by way of interest and depreciation and any surplus obtained would be divisable equally between the Government and the men. This would make the men real share-holders in the concern and would tend to inculcate a spirit of endeavour to produce good results. The dividend would be distributed as often as possible, perhaps even monthly, and would be arrived at from the frequently struck balances mentioned before. This idea, of course, could only be carried out if entire freedom from ordinary Government Rules were obtained. This system of sharing has been in use in some shops for a considerable time and is proving most satisfactory.

Working Plant.

The Workshop was put together as best it might from time to time, second hand and even broken machines being picked up here and there at the lowest possible figures, and only once has the concern been stiffened by a grant for new machinery. Unfortunately, these economical considerations compelled me to buy a large cheap machine, whereas if a little more money had been spent an enormously valuable adjunct to the shop would have been procured. This hand to mouth method of advancing

has not been too satisfactory, and a great deal of machinery at present employed costs almost more to keep up than it earns. Also as a manufacturing and jobbing outfit it is incomplete in several ways, and in order to make it an efficient concern some additions and completions are needed. Sanction to purchase some of these has been requested as being urgently necessary, but various other extremely useful things should be obtained to make it really complete. The old machines, if of doubtful value commercially, in competition with with the most uptodate plant of the world, would be quite useful for the training of the boys.

Valuation of the Plant.

If this proposal finds favour, I think that in order to give the Workshop a fair commercial start a new valuation should be undertaken and a fresh reduced capital value made.

General economic conditions with regard to education.

Having now considered roughly my general idea for working the Workshops as a factory, the question of the possibility of utilising them for educational purposes follows- In British India, England and, indeed, in almost all parts of the world political economists have stepped in and prevented the carrying out by the State of combinations such as, in my belief, are by far the most suitable for the satisfactory evolution of craftsmen and engineers generally, Immediately Government embarks on a policy of commercial venture there is an outcry that private enterprise is being killed. While I believe that this is entirely a fallacious notion as, by the very virtue of their Government status, it is difficult to obtain commercial efficiency unless some such steps as I propose are adopted, yet the outcries have been so strong that Governments have found it difficult to disregard them. Again, in the outside world, competition enforces a high class of work. In Hyderabad there is none of this, and the only result of any competition that a Government workshop

Restricting difficulties elsewhere.

Government must not compete with traders.

Hyderabad exempt

causes, working with the objective of a high quality of work as a hard and fast rule, is the improvement of the general standard in the State. This in itself is a valuable educational asset, so that no outcry against a productive Government Department should be considered nor any fear entertained in adopting methods different from those in use elsewhere, as circumstances there do not permit of their being carried out successfully.

Teaching of students would not be by any means without expense to the Workshop. The foreman and, indeed, each craftsman would have to spend a certain amount of the workshop's time in imparting instruction that is to say, if the scheme is carried out as I propose Further, learners do a considerable amount of damage to plant and matrial. They are, therefore, not an asset commercially, and, for this reason, no commercial undertakings could afford to give instruction on the lines that I suggest without a Government subsidy, and that subsidy would have to be very high for any manufacturing, non-philanthropic concern to accept, as the amount of additional trouble caused by a large number of boys thus carefully looked after would be more than they would be desirous of enduring. Works do, of course take in pupils and teach them, but this is with the intention of utilising their services themselves afterwards, and they gain in this way. Oneeof the principal objects of maintaining the workshop here being the education of craftsmen, the question of trouble does not arise, but for the shop to work commercially that of loss does, and it would be necessary that the Government should pay to the Workshop a certain subsidy per pupil to meet this.

At first, at any rate, I believe that it would be highly advantageous to concentrate on the teaching of crafts as opposed to arts at Head-quarters. The object of technical education is to improve the standard of work and the technique of the artisans. In order to do this it is necessary that in each branch of instruction there should be a man of really superior proficiency. Such a man can only be obtained by paying a handsome salary. It follows, therefore, that inasmuch as each school would require one, with several schools/the combined cost would of necessity be very great. With concentration, Government could afford to pay one man a salary which would be totally out of the question if it had to be paid to many. Further, in these circumstances, a much higher degree of skill could be obtained. Exactly what crafts should be taught at head-quarters can be left with some elasticity for decision.

What crafts desirable.

The following are essential, however :--

Machine-Tool men.

Blacksmiths (Including drop forging and repetition workers)

Fitters (Including Millwrights and highly skilled fine fitters)

Carpenters (including joiners, cabinet makers and pattern makers)

Tinsmiths (This art is in a very backward state and needs careful tuition)

Copper workers (Copper spinning, which is done extremely widely today and is completely unknown in the State and which should enable cheaper and better work to be produced, should be included.)

Electric & Acetylene Welders. (These are extremely important at the present time. Acetylene welding can be carried on in any district although electric welding naturally needs an electric supply. The practical advancement obtainable by the utilisation of these methods is the more amazing, the more one sees the need.)

In addition to these crafts, arts such as enamel-

in-

and hign grade decorative painting could be undertaken as desired, continued and expanded if successful.

The Motor Car problem.

There is one very important use to which the institution could be put. At present it is notorious that th difficulty of getting repairs done to motor cars is extreme. and that motor car drivers and mechanics are very inefficient For a time a certain amount of general repair was done in the shops and occasionally now odd jobs which cannot be tackled outside are attended to, but it has always been highly unsatisfactory. The subject is an important one, especially in view of the fact that motor buses are to be used by the State. Save for one or two tools there is no extra equipment needed in the Mint for making a really first class repair shop. To carry this out satisfactorily, it is necessary that a highly trained engineer from the repair shop of an important automobile firm should be engaged for at least 3 or 4 years until a local man can be trained to take his place. Objections would immediately crop up that the repair shops which are working at present would be killed by a Government supported department. As I have pointed out, before, this would be an absolutely fallacious argument, inasmuch as it would merely be a competition in the open market, and the only reason why work would be sent here would be that the public would obtain better service and by no means at the expense of the State. If this were so, the motor car firms certainly might suffer as they would have invested money in their undertakings and, although deservedly, they might lose customers.

To overcome this difficulty, the Government would make it a rule that, just as at present, no cars can be repaired here save those for which special sanction is given by the Finance Department, so in the new arrangement only those cars under Finance orders or those sent in by

motor car firms would be dealt with, these firms being encouraged to make use of the facilities obtainable and left to make their own terms with their clients with regard to payment.

Motor Drivers' School

Beyond this, I consider that it would be highly desirable that men wishing to learn motor car driving should be taken in and trained.

In the first instance, we should have no trained students ready to carry on, and it would be necessary for outsiders to come. They would be given a thorough course of the repair and overhaul of various cars and be instructed in the correct methods of driving. Upon completing this course, the men who proved themselves to have a proper knowledge of the mechanism of a car and its treatment and who had been passed as efficient in driving should be awarded a certificate. This no doubt would very soon grow to be of value if the men trained were to prove as efficient as I think they would, in which case the public generally would benefit very materially by improved service for their motor cars.

Certificates renewable annually.

So as to have control over the men after leaving, their certificates should be subject to cancellation. In order to make this effective, a fresh licensing certificate should be given annually.

Method of imparting. Manual training.

The Workshop at present is working about 8 hours a day end under the co-operative arrangement that I suggest it may very likely be decided by the workmen to increase the time to 9 hours, as thereby they would be getting a better income. All, save 3 of these hours, I consider, should be spent in manual training. Each skilled artificer would be provided with an apprentice or two and it would be the artificer's duty to impart

Distribution of apprentices.

as much practical training as possible. By degrees, the students would become capable of undertaking independent work, the intricacy of which would be increased in proportion to the proficiency obtained. This however, by itself, would not be sufficient. It is necessary that there should be very highly skilled overseers whose duty would be to watch the various artisans and see that they were imparting correct and sufficient instruction to their assistants and also to give the necessary information and guidance to the students when undertaking independent work.

Training Overseers necessary.

Highest quality of Instructors essential.

The world of practical engineering has been moving at a very great speed lately and it would be madness to aim at anything less than the best. Therefore, it is necessary that the instructors in this service should be of the highest quality obtainable. If the recent munition work has provided Indian workmen of sufficient skill and knowledge, I think that they should be searched for and offered sufficient inducement, which would of course have to be considerable, to come and undertake the work. If however, such workmen cannot be found it will not be essential to appoint any Europeans in the service of the State. I have mentioned before that certain extra machinery would be necessary and arrangements could be made with the suppliers to provide the necessary instruction in the first instance. For instance, I think it quite possible that if Messrs. Alfred Herbert were called upon to supply a milling machine which we want so badly in the shops, they might at the same time be persuaded to send out a machine-man very competent in all grades of machine shop work. Very likely they could be induced to do this at reasonable cost in the hope of making our workshops so much more

successful that they might at some future time obtain good orders. The same holds good with regard to smithy work. We are at present doing some very good work, but not such as can compete with the other markets and we want our men to be taught to attain this efficiency. If a pneumatic hammer were sent out I believe that the firm would be able to arrange for a very highly skilled smith to come out with it and stay for a time to instruct our people in modern methods. The very fact of their being supplied by a contractor would at once remove the objection of their being possible permanent wage-earners in the State, and as they would not be engaged by the State there would be no necessity for appointing them. They would, in fact, be no more Government servants than would be an erector sent out with a firm to put up a plant supplied to order.

This deals in a general way with the arrangement for the supply of instruction in handicrafts. Practical training, however, can be carried further.

Examples of further utility in instruction.

For instance, there are in the State a great number of pumps, also a number of steam rollers and other appliances. If in accordance with my scheme these were brought into the Mint Workshops for repair, the shops could be provided with a testing department such as is found in any manufacturing works. Efficiency tests and so forth could be carried out. Not only would the economy of the machines in use by the State be greatly improved, but also, by this means, the men, having repaired them, would have a knowledge of their working, and this instruction would be superior to that arranged for anywhere else in the country. The ordinary supervisors have a rough and ready way of making machines go somehow until they break down.

This training would enable them, if suitable spare parts were provided, to prevent such breaks-down. The value of such men is obvious.

Facilities for learning drawing.

Attached to the works, at present, there is a drawing office. This drawing office would be expanded somewhat and the more advanced students would receive instruction there so as to enable them to make drawings sufficiently comprehensible for their requirements. to be clear to the manufacturer. Boys with special aptitude could even be turned into mechanical draughtsmen for whom there is a very great want throughout India.

This practically completes the engineering side of my scheme. There remains the scholastic portion.

Scholastic training of boys.

In my opinion, the boys should start their training as early as possible, say at the age of 8, and in order to attain the efficiency aimed at a course extending over about 12 years would be necessary. This, of course, would present difficulties for sons of poor parents unless the students obtained pay during their apprenticeship. I am not certain, however, that it would be necessary to give any remuneration during the first three years. Even if the boys are of any use at all to the concern they do an amount of damage equivalent to their work, if not more. After all however, while still causing considerable expense they begin to do money earning work and from the beginning of the 3rd year onwards I would propose a gradually increasing wage. As boys, when they have had a little instruction, often consider that they are fit for employment at a higher rate of pay outside, (and, indeed, may be able to obtain it, thereby causing a class of men who can claim training in the shops but who are of lower efficiency than that aimed at) it would probably be

desirable that a percentage of their pay should remain with the authorities which they would lose in the event of their leaving in this premature fashion. At the end, of course, certificates should be issued setting forth the qualifications of each man. I would not issue merely a formal certificate but complete it by giving a general statement of the efficiency of each individual.

Apportionment of time.

I have mentioned before that I consider that 3 hours daily should be spent on scholastic work, the balance being devoted to practical training. The boy who is regularly at work but not in any way overstrained is far healthier than the one who is allowed to run about unchecked and, if healthier, also happier. In the quite early

Easy early work.

stages, work in the workshops for the boys need be little more than instructive play. So there is no particular necessity to provide leisure for him to make mud pies or the equivalent.

Amount of diversion necessary.

As he grows older, however, it might be advisable to arrange some form of games for his entertainment, but, in the first daily occupation, in most cases, he would be obtaining physical exercise and there would not be the need for the same amount of organised exercise as a boy should have who is engaged in sedentary pursuits during the day.

Essential book work small.for a mechanic.

In my opnion the amount of scholastic knowledge that an ordinary mechanic or artisan should have for his own happiness and for the good of his work is but small. It consists of a really thorough fluency in both reading and writing the vernacular and a knowledge of elementary arithmetic. The boy who is not equipped mentally to pursue higher studies may be a perfectly satisfactory work. man and a happy and efficient citizen, if, at the same, time he is an adept craftsman.

Primary school of special kind

For the purpose of imparting rudimentary education, a primary school would be necessary. It would, however, not come under the budget head of technical education, unless the fact of its being run on very different lines from those ordinarily adopted would necessitate this.

Suggested curriculum.

The following is an outline of the curriculum that I consider should be adopted. This, like many other suggestions in this note, can be developed if my scheme is approved.

Three periods of study.

I suggest that there should be three periods study divided up as follows :--

Period (1)	Subjects.	Reading and Writing Urdu and Elementary Arithmetic.
" (2)	"	Reading and Writing Urdu, Arithmetic, Elementary Geometry, Elementary Science and Commercial Geography.
" (3).	"	Usual Technical College course

The First Period

During the first period, I consider that only reading and writing and simple arithmetic should be taught, but the instruction must be very thorough.

The second period.

During the second period, reading and writing should be continued and care should be taken to choose text books containing simply written, instructive articles on such subjects as elementary science, commercial geography and Indian History, and the boys should be encouraged to ask questions and discuss the subjects about which they read. Writing might now take the form of simple compositions on subjects of general interest and reproduction of articles contained in the reading book. Arithmetic would be carried somewhat further and include mensuration which, together with a little geometry would complete the mathematics necessary. This teaching would be designed to impart a general idea

of present day affairs rather than a special knowledge of any particular subject thereby enabling the the artisan to have sufficient instruction for the adequate performance of his trade and such a general understanding as would make him think and act as a useful citizen. If his brain were of sufficient capacity, this training would engender a desire for further instruction.

The Third period. The third period would be divided into two parts, (a) for those who at the age of 14 or thereabouts prove themselves to be of such calibre that they are fit to take superior positions, and (b) for those who can only remain as handicraftsmen.

I do not consider that it would be necessary to arrange for any further special instruction for the (b) division. The course of study indicated above would equip a boy with all that he would need to know if he were merely to remain a mechanic, without bothering him with unnecessary mental effort if not inclined to pursue higher studies.

Arrangement could be made whereby boys of over 14 could obtain assistance in pursuing further studies, but this would be outside the actual school curriculum. If the general principles were accepted, details for the accomplishment of this could be submitted with the complete scheme.

If after the first six years the boys have failed to attain sufficient knowledge they could remain for an additional year in the second period to give them a chance of improvement. This, however, would, of course, be at the discretion of the authorities. Upon their being considered sufficiently well grounded, their regular school teaching would cease and their whole time would be spent in the shops perfecting themselves in the details of their crafts.

It might be thought that the subject of drawing

nas been forgotten for the lower grades and that it should be included. I am of opinion that the value of teaching drawing has been very much overestimated. It is a subject which is extremely useful to teach. It is a subject which lends itself most delightfully to the exhibition of their results by the teachers, but what its real value is to the artisan is a very different matter. It is true that an artisan should be able to read a simple mechanical drawing Ability to do this, however, can be acquired in the shops. When drawings for work come through, the apprentices working will pick up the directions from their teachers. If it proves that I have gone to the other extreme and underestimated the amount of teaching that would be desirable in this branch, sufficient could easily be added to meet any possible requirements with practically no change in the arrangements.

Teaching of the higher grade would, of course, be special and would comprise much the same curriculum as that at present in use in technical colleges, modifying the subjects so as to impart knowledge of real practical utility rather than catering for the passing of examinations.

General practical training.

During this period, their practical training would no longer be restricted to one department, but they would be moved through all the branches so as to obtain a good working knowledge of all the handicrafts connected with general engineering. There would no doubt be more able students who would quickly acquire the supervisor standard. Although I believe that if this scheme were carried out development would be rapid and that with a really first class equipment more skilled work would quickly follow, at first it would be better to leave the finishing of the training of these boys to other advanced

institutions by means of scholarships. I believe, however- that if my scheme were carried further, in future, it would produce a better class of trained engineers than any other that has yet been devised, this being due to the fact, as I have mentioned before, that this State, being untrammelled by the fads of political economists and the outcry of the public, could take steps which otherwise would be impossible.

The students of the first and second periods then would have three hours daily of school work and for this purpose they would be divided into two groups. If the shop hours of work remained as at present, viz., 9 a.m. to 5 p.m. the school hours would be from 9 a.m. to 12 noon and from 2 to 5 p.m. Each group would spend four hours daily in the workshops and 3 hours in school and one hour would be allowed for meals and rest.

I believe it to be a fact that it is injurious to young boys to have mental work every afternoon, but if there were only morning school the capacity both of the shops and the school would be halved. In order to get the most out of the institution and at the same time minimise the evil of afternoon teaching, it would be arranged that the boys who had morning classes one day would have afternoon ones the next day.

The total capacity of the workshops for student at any one time would be about 150. By rotation in teaching this would mean a capacity of 250 ordinary students together with as many of the higher grade specialists of the last period as might be coming through. These, being occupied in intensive study, testing and so forth, would not affect the capacity of the shops. There would be some 50 carrying on as whole time students in the lower grade of the third period.

A certain excess of this number could be allowed for as, toward the completion of their course, they would be doing independent work and, as such, would be improvers rather than students. There would be in each of the first two periods, say 100 boys of whom half would be in the shops at a time, making a total of some 300 in training at once.

These, of course, are rough figures. Experience alone could show the actual proportion of boys that there would be in the 3 grades, the percentage that would pass right through the course, the number that would drop out at the various stages and the real capacity of the concern

Hostel desirable.

As it is proposed to centralise teaching crafts it is natural that many boys would come in from the districts. There is also the fact that the Hyderabad area itself being great much difficulty would be found by some of the boys in coming to work from long distances It, therefore, seems to me highly desirable that a good class of hostel should be built close to the works, a building that would have to be erected by Government and for which no rent or upkeep would be charged and on which the only return would be the production of good citizens. I think, however, that the students should pay for their board expenses. The hostel should be in charge

General welfare of work desirable.

of a man whose duties should include the supervision of the general welfare of the boys. Besides looking after their good behaviour and the ordered upkeep of the establishment, he should arrange for their entertainment and amusement, encouraging games and hobbies generally. He should be selected from among the heads of the present district technical schools where his services would no longer be required.

Site of Hostel.

A healthy site should of course be selected,

not necessarily very close to the works; There would be no need for the boys to go there for their mid-day meal, as I propose that there should be a properly run canteen in the works which would be greatly appreciated by the workmen generally.

Canteen at the works

Reading room desirable.

Another adjunct for the combined institution would be a reading room in which technical journals would be on view, and possibly some of the more important articles might be translated for the benefit of those unable to read English.

Details can be dealt with later.

This is the general outline of my proposal. Details, of course, would have to be worked out all the way along, but it would be a very big undertaking and general principles must be accepted before it is embarked upon. This also applies to the question of finance. I think, however, it will be seen that the cost of my proposal should be very small, which, probably is not the least satisfactory of its features.